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10/628,546	07/28/2003	Bo Thiesson	MS305277.1/MSFTP485US	6935

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EXAMINER	
BERMAN, MELISSA J	
ART UNIT	**PAPER NUMBER**
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

MN

Office Action Summary	Application No.	Applicant(s)	
	10/628,546	THIESSON ET AL.	
	Examiner	Art Unit	
	Melissa J. Berman	2129	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on 29 January 2007.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-9,11-16 and 18-23 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-9,11-16 and 18-23 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 08 July 2003 is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

This action is responsive to application 10/628546 filed on 7/28/2003. Claims 1-9, 11-16, and 18-23 have been examined. The previous office actions have been withdrawn.

Claim Objections

Claims 1, 2, 7, 11-15, and 23 are objected to because of the following informalities:

- The phrase "and/or" is not clear in scope. Examiner suggests "or".

Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1-9, 11-16, and 18-23 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Claims 1, 11, 14, and 21 describe non-standardized data being scored based on shifting and scaling the data, however the data is only virtually *shifted*, not shifted and scaled. The disclosure does not describe a way in which the data can only be virtually shifted, and not virtually scaled to achieve a score. Claims 2-9, 12-13, 15-16, 18-20, and 22-23 are rejected based on their dependency to claims 1, 11, 14, and 21.

Claim 21 recites a "first data field describing a non-standardized set or subset of data" and "a second data field describing a decision tree and associated branches". These fields are

apart of a tangible medium with a data structured stored thereon. It is unclear how this tangible medium with a data structure would be able describe an entire decision tree and its associated branches in a singular "field". There is no description in the disclosure indicates this data structure with three data fields is functional. Claims 22 and 23 are rejected based on their dependency to claim 21.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 1-9, 11-16, and 18-23 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

In determining whether the claim is for a "practical application," the focus is not on whether the steps taken to achieve a particular result are useful, tangible, and concrete, but rather that the final result achieved by the claimed invention is useful, tangible and concrete. If the claim is directed to a practical application of the §101 judicial exceptions producing a result tied to the physical world that does not preempt the judicial exception, then the claim meets the statutory requirement of 35 U.S.C. §101.

The claims are a manipulation of abstract concepts and are not clear in purpose or scope. Variations on the phrases in the claims, such as 'virtually shifted through omission of a matrix operation' do not provide a clear purpose or scope for the claimed invention.

The invention must be for a practical application and either:

1) specify transforming (physical thing - article) or

2) have the Final Result (not the steps) achieve or produce a

useful (specific, substantial, AND credible),

concrete (substantially repeatable/non-unpredictable), AND

tangible (real world/non-abstract) result

(tangibility is the opposite of abstractness).

A claim that is so broad that it reads on both statutory and non-statutory subject matter must be amended.

In the present case, claims 1-9, 11-16, and 18-23 **preempt** a wide variety of data mining using decision tree learning. Data mining is the process of identifying commercially useful patterns or relationships in databases or other computer repositories. Data mining is not a practical application, but rather a technique which can be employed for practical application, such as implementing data mining for understanding a consumer grocery purchases, data mining for monitoring the efficiency of a website's navigation, data mining for pattern recognition in images, data mining for diagnosis of medical illnesses, etc.

The courts have also held that a claim may not preempt ideas, laws of nature or natural phenomena. The concern over preemption was expressed as early as 1852. See Le Roy v. Tatham, 55 U.S. (14 How.) 156, 175 (1852) ("A principle, in the abstract, is a fundamental truth; an original cause; a motive; these cannot be patented, as no one can claim in either of them an exclusive right."); Funk Bros. Seed Co. v. Kalo Inoculant Co., 333 U.S. 127, 132, 76 USPQ 280, 282 (1948).

Accordingly, one may not patent every "substantial practical application" of an idea, law of nature or natural phenomena because such a patent "in practical effect would be a patent on

the [idea, law of nature or natural phenomena] itself." "Here the "process" claim is so abstract and sweeping as to cover both known and unknown uses of the BCD to pure-binary conversion. The end use may (1) vary from the operation of a train to verification of drivers' licenses to researching the law books for precedents and (2) be performed through any existing machinery or future-devised machinery or without any apparatus." Gottschalk v. Benson, 409 U.S. 63, 71-72, 175 USPQ 673, 676 (1972).

The Courts have found that subject matter that is not a practical application or use of an idea, a law of nature or a natural phenomenon is not patentable. As the Supreme Court has made clear, " [a]n idea of itself is not patentable," *Rubber-Tip Pencil Co. v. Howard,* 20 U.S. (1 Wall.) 498, 507 (1874); taking several abstract ideas and manipulating them together adds nothing to the basic equation. In re Warmerdam, 31 USPQ2d 1754 (Fed. Cir. 1994).

Claims that score a split in data are not statutory without a final output that is useful, concrete, and tangible. Claims 1-9, 11-16, and 18-23 do not provide an output. The scoring of a split is simply a manipulation of data, and therefore abstract.

Appropriate corrections are required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claim 1-3, 5-7, 11-15, 19-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Chickering et al.** ("Efficient Determination of Dynamic Split Points in a Decision Tree", 1997) and further in view of **Riskin et al.** ("Lookahead in Growing Tree-Structured Vector Quantizers", 1991) hereafter referred to as **Riskin**.

Claim 1, 11, 21

Heckerman discloses a system that facilitates decision tree learning, comprising:

a learning component that generates non-standardized data (see e.g, 1. Introduction, 2. Background and Notation; EN: Data has not been standardized) that relates to a split in a decision tree (predictor values, see e.g, 1. Introduction, especially P 92, C 1, where predictor values identify potential split points; 2. Background and Notation; 3. Some Efficient Discretization Methods, especially 'identifying split points'); and

a scoring component that scores the split as if the non-standardized data at a subset of leaves of the decision tree had been shifted and/or scaled (see e.g., 1. Introduction, especially p 92, C 1; 2. Background and Notation, especially p 92-93),

Chickering does not specifically disclose the non-standardized data virtually shifted through omission of a matrix operation.

However, **Riskin** teaches the non-standardized data virtually shifted through omission of a matrix operation (lookahead, see e.g., IV. Lookahead in Growing Trees, especially p 2290 C 2, " … it looks ahead to a depth of one in the tree to measure the resulting slope of a decrease in distortion to increase in rate before it splits a candidate node", EN: the lookahead performs a measurement of a possible future node, such as shifting, but does not complete the shift. This reads on "virtually shift").

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of **Chickering** with **Riskin**. One would have been motivated to do so because the "lookahead" is a commonly known and used technique used in algorithms for efficiency since the lookahead technique relieves the need for pruning of the tree since it is using measurements and scores of candidate nodes. Lookahead reduces the complexity in the growing process and increases the efficiency of the growing (**Riskin**).

Claim 2, 13, 15, 23

Chickering discloses the system of claim 1, further comprising a modification component that for a respective candidate split score, the data is modified by shifting and/or scaling the data and a new score is computed on the modified data (scale, or standardize, see e.g., 1. Introduction, 2. Background and Notation; 4. Experiments, especially "standardized the ... data so that the target had mean zero and standard deviation one", EN: data is shifted and scaled to standardize the data).

Claim 3, 22

Chickering discloses the system of claim 1, further comprising an optimization component that analyzes the data and decides to treat the data as if it was: (1) shifted, (2) scaled, or (3) shifted and scaled (scale, or standardize, see e.g., 1. Introduction, especially "scale linearly"; 2. Background and Notation; 4. Experiments, especially "standardized the ... data so that the target had mean zero and standard deviation one", EN: data is shifted and scaled to standardize the data).

Claim 5

Chickering discloses the system of claim 1, the learning component processes continuous variable data or data subsets (continuous, see e.g., 1. Introduction; 2. Background and Notation; 4. Experiments).

Claim 6

Chickering discloses the system of claim 1, the scoring component generates evaluation indicating how well a model predicts continuous target data and whether or not the model is a suitable predictor for the target data (predictive accuracy, see e.g., 4. Experiments, EN: a tree models the data).

Claim 7

Chickering discloses the system of claim 6, the evaluation data is employed by users and/or subsequent automated components (see e.g., 4. Experiments; EN: experiment used datasets from the UC Irvine repository on a computer, where a computer is a 'automated component') when determining model performance and/or selecting between models or model subsets (evaluate performance, see e.g., 4. Experiments).

Claim 12

Chickering discloses the system of claim 11, further comprising means for determining whether to perform the shifting and/or scaling operations (see e.g., 2. Background and Notation; 3. Some Efficient Discretization Methods; EN: split points are examined and it is determined if they are suitable for approximation, by which they are then shifted and scaled to reach a desired distribution).

Claim 14

Chickering discloses a method that facilitates decision tree learning, comprising:

determining whether to perform a virtual shifting and/or scaling operation on a non-standardized set of data associated with leaves of a decision tree (see e.g., 2. Background and Notation; 3. Some Efficient Discretization Methods; EN: split points are examined and it is determined if they are suitable for approximation, by which they are then shifted and scaled to reach a desired distribution); and

automatically assigning scores to the leaves based in part upon the determination of whether to perform the virtual shifting and/or scaling operation (scoring criteria, see e.g., 2. Background and Notation, especially).

However, **Riskin** teaches the non-standardized data virtually shifted through omission of a matrix operation (lookahead, see e.g., IV. Lookahead in Growing Trees, especially p 2290 C 2, "... it looks ahead to a depth of one in the tree to measure the resulting slope of a decrease in distortion to increase in rate before it splits a candidate node", EN: the lookahead performs a measurement of a possible future node, such as shifting, but does not complete the shift. This reads on "virtually shift").

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of **Chickering** with **Riskin**. One would have been motivated to do so because the "lookahead" is a commonly known and used technique used in algorithms for efficiency since the lookahead technique relieves the need for pruning of the tree since it is using measurements and scores of candidate nodes. Lookahead reduces the complexity in the growing process and increases the efficiency of the growing (**Riskin**).

Claim 19

Chickering discloses the method of claim 14, determining at least one constant value before assigning the scores (k, see e.g., 3. Some Efficient Discretization Methods; 4. Experiments).

Claim 20

Chickering discloses the method of claim 19, the constant value relates to diagonal elements of a matrix and is assigned a value of about 0.01 (k = 0.01, see e.g., 4. Experiments, EN: a matrix is merely a data structure which elements may have a diagonal value of 0.01 since it is not defined what is in the matrix).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over **Chickering** and **Riskin** and further in view of **Heckerman** (Bayesian Networks for Data Mining, 1997).

Claim 4

Chickering and **Riskin** do not disclose the system of claim 1, the scoring component is employed for evaluating a data mining application.

However **Heckerman** teaches the system of claim 1, the scoring component is employed for evaluating a data mining application (data mining, see e.g., Abstract, 1. Introduction).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of **Chickering** and **Riskin** with **Heckerman**. One would have been

motivated to do so because Bayesian networks, which use a scoring component can readily handle incomplete data sets, allow one to learn about casual relationships, and in conjunction with Bayesian statistical techniques facilitate the combination of domain knowledge and data (**Heckerman**).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 8, 9, 16 and 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over **Chickering** and **Riskin** and further in view of **Minka** (Bayesian linear regression, 1999).

Claim 8

Chickering and **Riskin** disclose the system of claim 1, the scoring component includes at least one of a data sample processor (see e.g., 4. Experiments; EN: experiment used data samples from the UC Irvine repository on a computer, where a computer contains a processor), and a mean value for data or a data subset (see mean, e.g., 3. Some Efficient Discretization Methods; 4. Experiments).

Chikering and **Riskin** do not specifically disclose a scoring constant, a gamma function, a matrix value, and a vector value.

However **Minka** discloses a scoring constant (V, see e.g., 1. Introduction, EN: Jeffrey's prior has invariant X and invariant V; 2. Known V, EN: V is known and constant), a gamma function (see

e.g., 1. Introduction, especially "Γ"), a matrix value (matrix A, see e.g., 1. Introduction), and a vector value (vector v, see e.g, 1. Introduction).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of **Chickering** and **Riskin** with **Minka**. One would have been motivated to do so because **Chickering** describes the benefit and use of Bayesian scoring criterion, which avoids over-fitting by penalizing model complexity. Bayesian linear regression helps avoid over-fitting (**Minka**).

Claim 9

Chickering and **Riskin** do not specifically disclose the system of claim 1, the scoring component computes a Bayesian linear regression score as:

$$score = \pi^{-n/2}\left(\frac{v}{v+n}\right)^{1/2}\frac{\Gamma(\frac{\alpha+n}{2})}{\Gamma(\frac{\alpha}{2})}\left(\beta^{\frac{\alpha+r}{2}}\right)\frac{\left(\left|\mathbf{T}_n^{TR}\right|\right)^{-(\frac{\alpha+n}{2})}}{\left(\left|\mathbf{T}_n^{R}\right|\right)^{-(\frac{\alpha-1+n}{2})}},$$

$$\mathbf{T}_n = \mathbf{T}_0 + \mathbf{S}_n + \mathbf{U}_n$$
$$\mathbf{U}_n = \frac{vn}{v+n}(\bar{\mu}_0 - \bar{m}_n)(\bar{\mu}_0 - \bar{m}_n)'$$
$$\mathbf{S}_n = \sum_{i=1}^{n}(\bar{x}_i - \bar{m}_n)(\bar{x}_i - \bar{m}_n)'$$
$$\bar{m}_n = \frac{1}{n}\sum_{i=1}^{n}\bar{x}_i$$

wherein μ represents a mean, α denotes a degree of freedom, β connotes a pre-defined constant, bold-face symbols denote square matrices, symbols with overlines denote (one dimensional) vectors, the ′ [[']] symbol denotes transpose, and | | denotes determinant, n represents a number of records in the data, Γ is a gamma function satisfying Γ(x) = (x-1) Γ(x-1), $\bar{x}_i$ denotes a vector of values for relevant variables in an *ith* case in the data, the superscripts TR and R in $\mathbf{T}_n^{TR}$ and $\mathbf{T}_n^{R}$ denote that the matrices are defined with respect to target and regressor variables in a first case and regressor variables in a second case.

However **Heckerman** teaches the system of claim 1, the scoring component computes a Bayesian linear regression score as:

$$score = \pi^{-n/2}\left(\frac{v}{v+n}\right)^{1/2}\frac{\Gamma(\frac{\alpha+n}{2})}{\Gamma(\frac{\alpha}{2})}\left(\beta^{\frac{\alpha+r}{2}}\right)\frac{\left(\left|\mathbf{T}_n^{TR}\right|\right)^{-(\frac{\alpha+n}{2})}}{\left(\left|\mathbf{T}_n^{R}\right|\right)^{-(\frac{\alpha-1+n}{2})}},$$

$$\mathbf{T}_n = \mathbf{T}_0 + \mathbf{S}_n + \mathbf{U}_n$$
$$\mathbf{U}_n = \frac{vn}{v+n}(\bar{\mu}_0 - \bar{m}_n)(\bar{\mu}_0 - \bar{m}_n)'$$
$$\mathbf{S}_n = \sum_{i=1}^{n}(\bar{x}_i - \bar{m}_n)(\bar{x}_i - \bar{m}_n)'$$
$$\bar{m}_n = \frac{1}{n}\sum_{i=1}^{n}\bar{x}_i$$

> wherein μ represents a mean, α denotes a degree of freedom, β connotes a pre-defined constant, bold-face symbols denote square matrices, symbols with overlines denote (one dimensional) vectors, the ' [(')] symbol denotes transpose, and | | denotes determinant, n represents a number of records in the data, Γ is a gamma function satisfying Γ(x) = (x-1) Γ(x-1), $\bar{x}_i$ denotes a vector of values for relevant variables in an *ith* case in the data, the superscripts TR and R in $\mathbf{T}_n^{TR}$ and $\mathbf{T}_n^{R}$ denote that the matrices are defined with respect to target and regressor variables in a first case and regressor variables in a second case.

(see e.g., 1. Introduction, especially equations 11, 12, 14; 2.1 Model selection via the evidence, especially equations 27, 29; EN: the "score" is merely a Bayesian linear regression, based on a matrix with a Wishart distribution and is anticipated because it achieves the same goal)

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of **Chickering** and **Riskin** with **Minka**. One would have been motivated to do so because **Chickering** describes the benefit and use of Bayesian scoring criterion, which avoids over-fitting by penalizing model complexity. Bayesian linear regression helps avoid over-fitting (**Minka**).

Claim 16

Chickering and **Riskin** do not specifically disclose the method of claim 14, further comprising processing a model in a form of a linear regression.

However **Heckerman** teaches the method of claim 14, further comprising processing a model in a form of a linear regression (equations 1, 2, 3, see e.g., 1. Introduction).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of **Chickering** and **Riskin** with **Minka**. One would have been motivated to do so because linear regression is a common technique and helps avoid over-fitting (**Minka**).

Claim 18

Chickering and **Riskin** do not specifically disclose the method of claim 14, the virtual shifting operation includes modifying a subset of elements relating to a covariance matrix.

However **Heckerman** teaches the method of claim 14, the virtual shifting operation includes modifying a subset of elements relating to a covariance matrix (equations 5, see e.g., 1. Introduction; 2. Known V; 2.1 Model selection via the evidence).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of **Chickering** and **Riskin** with **Minka**. One would have been motivated to do so because a covariance matrix is often used in linear regression and is simply a larger data structure which holds the covariances of a scalar vector.

Conclusion

The prior art of record and not relied upon is considered pertinent to the applicant's disclosure.

- Tal et al. (Patent No. 6532457)
- Bernhardt et al. (Pub No. 2004/0002879)
- Yaung (Pub No. 2003/0023662)

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Melissa Berman whose telephone number is 571-270-1393. The examiner can normally be reached on 9/4/5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Vincent can be reached on 571-272-3080. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Melissa Berman

MB

David Vincent
SPE 2129
7/17/07